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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|------------------------|---------------------|------------------|
| 10/707,403 | 12/11/2003 | Fernando Gallego Hugas | 8133ES | 1402 |
| 23688 | 7590 | 12/08/2005 | EXAMINER | |
| Bruce E. Harang PO BOX 872735 VANCOUVER, WA 98687-2735 | | | SWERDLOW, DANIEL | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2646 | |

DATE MAILED: 12/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | | |
|------------------------------|------------------------|--|---------------------|--|
| Office Action Summary | Application No. | | Applicant(s) | |
| | 10/707,403 | | GALLEGO HUGAS ET AL | |
| | Examiner | | Art Unit | |
| | Daniel Swerdlow | | 2646 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,7-13 and 15-22 is/are rejected.
- 7) ☒ Claim(s) 3-6,14 and 20 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 December 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. **The drawings are objected to because:**

- Figures 3 through 9 require descriptive legends for blocks that are identified only by reference characters. 37 CFR 1.84 (o) states: "Suitable descriptive legends ... may be required by the examiner where necessary for understanding of the drawing."
- Sheets listing the equations used in the disclosure are presented with labels "Equation 1" through "Equation 10". 37 CFR 1.84(d) provides that "Chemical or mathematical formulae, tables, and waveforms may be submitted as drawings and are subject to the same requirements as drawings. Each chemical or mathematical formula must be labeled as a separate figure, using brackets when necessary, to show that information is properly integrated." As such, if applicant persists in presenting the equations separately from their context, applicant should correct these drawings to provide each equation with a figure number. Examiner suggests that incorporating the equations in the body of the written description would make it easier for readers, including the examiner, to understand the description.
- Figures 1 through 9 have poor line quality. 37 CFR 1.84(l) provides that "Every line, number, and letter must be durable, clean, black (except for color drawings), sufficiently dense and dark, and uniformly thick and well-defined. The weight of all lines and letters must be heavy enough to permit adequate reproduction. This requirement applies to all lines however fine, to shading, and to lines representing cut surfaces in sectional views."

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Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

2. **Claim 20 is objected to** because of the following informalities: The claim misspells --speed-- as "seed". Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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4. **Claims 1, 2, 7, 12, 13, 20 and 21 are rejected under 35 U.S.C. 112, second paragraph,** as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

5. Regarding Claims 1, 7, 12 and 20, the phrase "such as" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d). To advance prosecution, examiner treats the claims below based on the interpretation that the limitations following the phrase are merely exemplary and not limiting on the claim.

6. Regarding Claim 21, the phrase "for example" renders the claim indefinite because it is unclear whether the limitation(s) following the phrase are part of the claimed invention. See MPEP § 2173.05(d). To advance prosecution, examiner treats the claims below based on the interpretation that the limitations following the phrase are merely exemplary and not limiting on the claim.

7. Regarding Claims 1 and 12, the recitation "by means of several A/D, D/A converter, amplification and filtering means" is unclear as to whether the claims require all the listed elements or some subset thereof. To advance prosecution, examiner treats the claims below based on the interpretation that any subset of the limitations meets the claim.

8. Regarding Claims 2 and 13, the recitation "in the area of each one of a series of different areas" renders the claim indefinite because the extent of the area of an area is undefined. To advance prosecution, examiner treats the claims below based on the interpretation that the recitation is intended as --in each one of a series of different areas--.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. **Claims 1, 2, 12, 13 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Janse et al. (US Patent 5,768,398) in view of Schmidt (WO 99/41897).**

11. WO 99/41897 is prior art to the present application under 35 USC 102(b) based on its publication date of 19 August 1999. For convenience, US Patent 6,834,108 is used as an English translation of WO 99/41897. Figure and text citations in Schmidt made below refer to US Patent 6,834,108.

12. Regarding Claim 1, Janse discloses an amplification system comprising: a microphone (Fig. 2, reference 2; column 4, lines 22-24) that corresponds to the first microphone claimed and generates an electrical signal with a signal processing system that corresponds to the several means claimed; a loudspeaker (Fig. 2, reference 6; column 4, lines 40-42) that corresponds to the speaker claimed that receives the electrical signal from the signal processor and transforms it to an acoustic signal that can be received by the microphone (column 3, lines 40-44); and an acoustic echo canceller (Fig. 2, reference 20; column 4, lines 23-27) that cancels coupling between the speaker and microphone (i.e., removes feedback). Therefore, Janse anticipates all elements except additional filtering to reduce residual echo and noise picked up by the microphone. Schmidt discloses use of post-filtering (i.e., additional filtering) (Figs. 2, 12, reference 30) to reduce residual echo (column 2, lines 18-22) and interference (i.e., noise)

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(column 16, lines 9-12). Schmidt further discloses that such an arrangement allows the system to operated with reduced attenuation (i.e., greater gain) (column 2, lines 22-25). It would have been obvious to one skilled in the art at the time of the invention to apply the post-filtering taught by Schmidt to the amplification system taught by Janse for the purpose of realizing the aforesaid advantage.

13. Regarding Claim 2, mere duplication of parts has no patentable significance unless a new and unexpected result is produced. See *In re Harza*, 274 F.2d 669, 124 USPQ 378 (CCPA 1960).

14. Claims 12 and 13 are essentially similar to Claims 1 and 2, respectively, and are rejected on the same grounds.

15. Regarding Claim 18, Schmidt further discloses automatic gain control applied after the post-filtering (Figs. 2, reference 24, 26; column 3, lines 47-49).

16. **Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Janse in view of Schmidt and further in view of Grayson et al. (US Patent 5,995,816).**

17. Regarding Claim 7, Schmidt further discloses automatic gain control applied after the post-filtering (Figs. 2, reference 24, 26; column 3, lines 47-49). Therefore the combination makes obvious all elements of Claim 7 except gradual gain control using a weighted average. Grayson discloses automatic gain control using a weighted average (column 1, lines 48-60). Grayson further discloses that such an arrangement prevents noise bursts from greatly attenuating the controlled signal (column 2, lines 27-33). It would have been obvious to one skilled in the art at the time of the invention to apply the weighted average gain control taught by

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Grayson to the combination made obvious by Janse and Schmidt for the purpose of realizing the aforesaid advantage.

18. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Janse in view of Schmidt and further in view of Grayson and further in view of Tanaka et al. (US Patent 4,558,460).

19. Regarding Claim 8, as shown above apropos of Claim 7, the combination of Janse, Schmidt and Grayson makes obvious all elements except gain control based on vehicle speed. Tanaka discloses gain control based on vehicle speed (column 1, lines 48-53). Tanaka further discloses that such an arrangement provides convenience for the vehicle operator (column 1, lines 17-20). It would have been obvious to one skilled in the art at the time of the invention to apply the speed-based gain control taught by Tanaka to the combination made obvious by Janse, Schmidt and Grayson for the purpose of realizing the aforesaid advantage.

20. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Janse in view of Schmidt and further in view of Akram (US Patent 4,503,398).

21. Regarding Claim 9, as shown above apropos of Claim 2 the combination of Janse and Schmidt makes obvious all elements of Claim 9 except gain control preventing saturation. Akram discloses an automatic gain control circuit that prevents saturation (column 1, lines 7-10). Akram further discloses that such an arrangement prevents undesirable audible artifacts (column 1, lines 18-21). It would have been obvious to one skilled in the art at the time of the invention

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to apply the saturation-preventing gain control taught by Tanaka to the combination made obvious by Janse and Schmidt for the purpose of realizing the aforesaid advantage.

22. Claims 10, 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Janse in view of Schmidt and further in view of Tanaka.

23. Regarding Claim 10, as shown above apropos of Claim 2 the combination of Janse and Schmidt makes obvious all elements except gain control by a user through a panel of buttons. Tanaka discloses a vehicle audio gain control circuit (column 2, lines 42-49) controlled by user through a panel of buttons (Fig. 7, reference 5). Tanaka further discloses that such an arrangement prevents adjustment to changes in the mechanical condition of the vehicle (column 4, lines 30-38). It would have been obvious to one skilled in the art at the time of the invention to apply the user-controlled gain control taught by Tanaka to the combination made obvious by Janse and Schmidt for the purpose of realizing the aforesaid advantage.

24. Regarding Claim 16, as shown above apropos of Claim 12, the combination of Janse and Schmidt makes obvious all elements except gain control based on vehicle speed. Tanaka discloses gain control based on vehicle speed (column 1, lines 48-53). Tanaka further discloses that such an arrangement provides convenience for the vehicle operator (column 1, lines 17-20). It would have been obvious to one skilled in the art at the time of the invention to apply the speed-based gain control taught by Tanaka to the combination made obvious by Janse and Schmidt for the purpose of realizing the aforesaid advantage.

25. Regarding Claim 17, as shown above apropos of Claim 12 the combination of Janse and Schmidt makes obvious all elements except gain control by a user through a panel of buttons.

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Tanaka discloses a vehicle audio gain control circuit (column 2, lines 42-49) controlled by user through a panel of buttons (Fig. 7, reference 5). Tanaka further discloses that such an arrangement prevents adjustment to changes in the mechanical condition of the vehicle (column 4, lines 30-38). It would have been obvious to one skilled in the art at the time of the invention to apply the user-controlled gain control taught by Tanaka to the combination made obvious by Janse and Schmidt for the purpose of realizing the aforesaid advantage.

26. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Janse in view of Schmidt and further in view of Fang et al. (US Patent 6,480,610).

27. Regarding Claim 11, as shown above apropos of Claim 2 the combination of Janse and Schmidt makes obvious all elements except using an NLMS algorithm. Fang discloses a use of the NLMS algorithm in feedback suppression (column 6, lines 33-56). Fang further discloses that such an arrangement provides increased convergence speed (column 6, lines 33-35) and avoids problems associated with the LMS algorithm for feedback cancellation (column 6, lines 49-53). It would have been obvious to one skilled in the art at the time of the invention to apply the NLMS algorithm taught by Fang to the combination made obvious by Janse and Schmidt for the purpose of realizing the aforesaid advantages.

28. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Janse in view of Schmidt and further in view of Lucey et al. (US Patent 4,490,584).

29. Regarding Claim 15, as shown above apropos of Claim 12 the combination of Janse and Schmidt makes obvious all elements except proportional microphone attenuation and speaker

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amplification. Lucey discloses the use of proportional microphone attenuation and speaker amplification (column 2, lines 31-34). Lucey further discloses that such an arrangement provides constant loop gain and avoids unacceptable feedback (column 2, lines 35-37). It would have been obvious to one skilled in the art at the time of the invention to apply the proportional microphone attenuation and speaker amplification taught by Lucey to the combination made obvious by Janse and Schmidt for the purpose of realizing the aforesaid advantages.

30. Claims 12 and 19 through 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Finn et al. (US Patent 6,496,581) in view of Schmidt.

31. Regarding Claim 12, Finn discloses an acoustic system comprising: a microphone (Fig. 2, reference 36) that corresponds to the first microphone claimed and generates an electrical signal with a signal processing system that corresponds to the several means claimed; a loudspeaker (Fig. 2, reference 32) that corresponds to the speaker claimed that receives the electrical signal from the signal processor and transforms it to an acoustic signal that can be received by the microphone (column 6, lines 24-40); and an acoustic echo canceller (Fig. 2, reference 120) that cancels coupling between the speaker and microphone (i.e., removes feedback). Therefore, Finn anticipates all elements except additional filtering to reduce residual echo and noise picked up by the microphone. Schmidt discloses use of post-filtering (i.e., additional filtering) (Figs. 2, 12, reference 30) to reduce residual echo (column 2, lines 18-22) and interference (i.e., noise) (column 16, lines 9-12). Schmidt further discloses that such an arrangement allows the system to operated with reduced attenuation (i.e., greater gain) (column 2, lines 22-25). It would have been obvious to one skilled in the art at the time of the invention to apply the post-filtering taught by

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Schmidt to the amplification system taught by Finn for the purpose of realizing the aforesaid advantage.

32. Regarding Claim 19, Finn further discloses implementation as a digital voice enhancement system (column 8, lines 12-25) that inherently has a digital signal processor and A/D and D/A converters since it processes digital signals and receives analog inputs and produces analog outputs.

33. Regarding Claim 20, Finn further discloses a cellular phone (i.e., mobile telephone terminal) linked to the digital voice enhancement system (column 7, lines 33-34) and automatic control depending on vehicle speed (column 2, lines 21-35).

34. Regarding Claim 21, Finn further discloses occupant sensing and voice activity detection (i.e., an interface) (column 1, line 61 through column 2, line 6).

35. **Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Finn in view of Schmidt and further in view of Staudacher (US Patent 5,533,120).**

36. Regarding Claim 22, Finn further discloses several adaptive filters to cancel feedback between several speakers and several microphones (Fig. 2, reference 120, 122). Therefore, the combination of Finn and Schmidt makes obvious all elements except using a standardized LMS algorithm. Staudacher discloses a use of the LMS algorithm in feedback suppression (column 8, lines 40-49). Staudacher further discloses that such an arrangement removes periodic signals produced by acoustic feedback (column 10, lines 14-17). It would have been obvious to one skilled in the art at the time of the invention to apply the LMS algorithm taught by Staudacher to

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the combination made obvious by Finn and Schmidt for the purpose of realizing the aforesaid advantages.

Allowable Subject Matter

37. **Claims 3 through 6 and 14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims and if issues of indefiniteness as cited above under Claim Rejections 35 USC 112 were resolved.**

38. Regarding Claim 3, as shown above apropos of Claim 2, the combination of Janse and Schmidt makes obvious all elements of that claim. In addition, Schmidt discloses use of Wiener filtering for the post-filtering (column 4, lines 62-65) using power density spectra (column 17, lines 43-47). However, Schmidt fails to disclose the residual echo elimination and noise suppression applied in cascade with the residual echo elimination applied first, as claimed. As such, the prior art fails to disclose all elements of the claimed invention. Therefore the claim is allowable matter.

39. Claims 4 through 6 are allowable matter due to dependence from Claim 3.

40. Claim 14 is essentially similar to Claim 3 and is allowable matter for the same reasons.

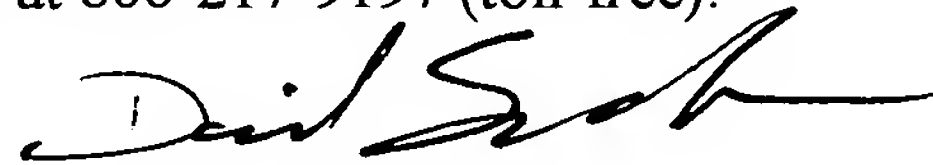
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel Swerdlow whose telephone number is 571-272-7531. The examiner can normally be reached on Monday through Friday between 7:30 AM and 5:00 PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh H. Tran can be reached on 571-272-7564. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Daniel Swerdlow
Examiner
Art Unit 2646

ds

23 November 2005